6097703

FIG. 1

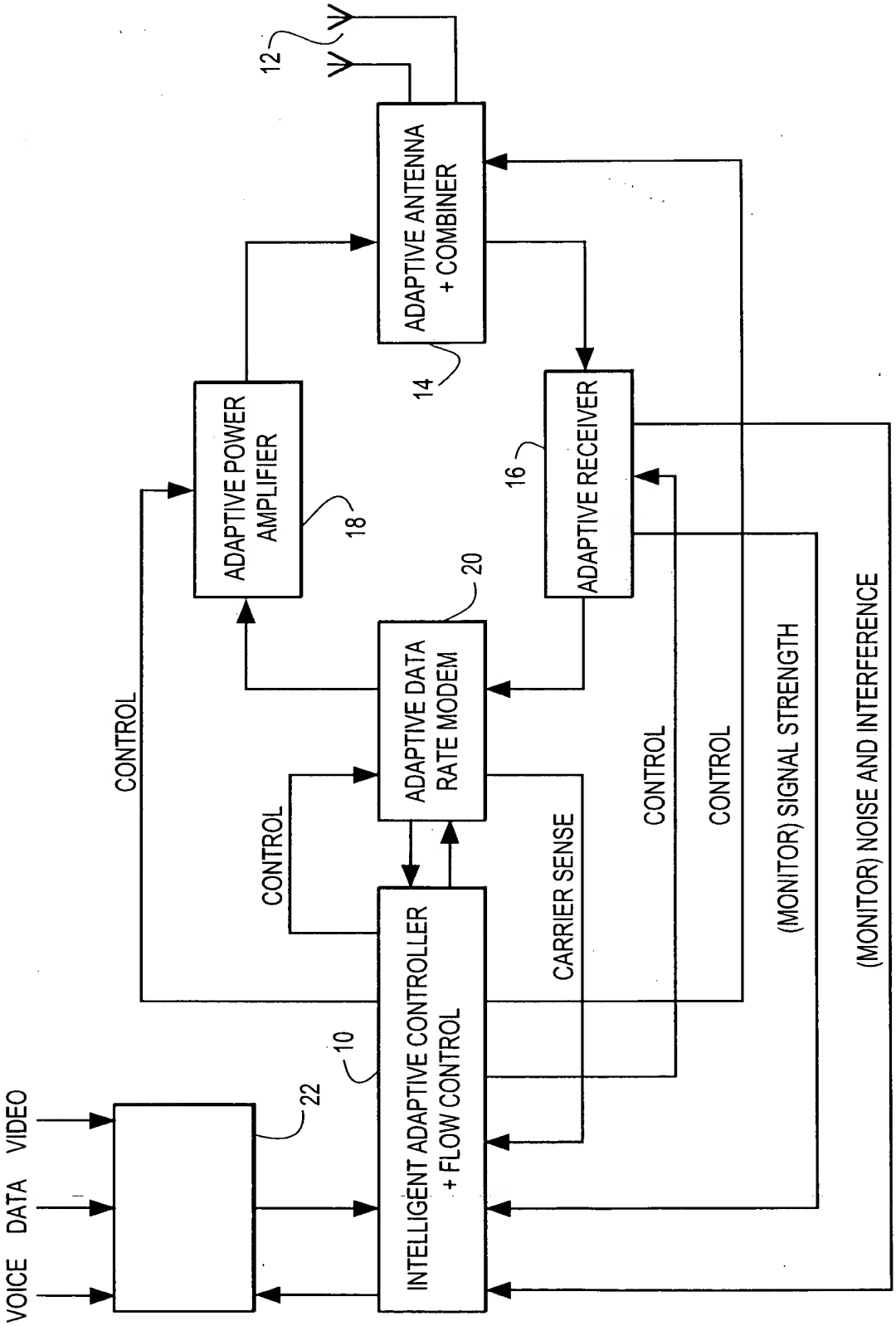
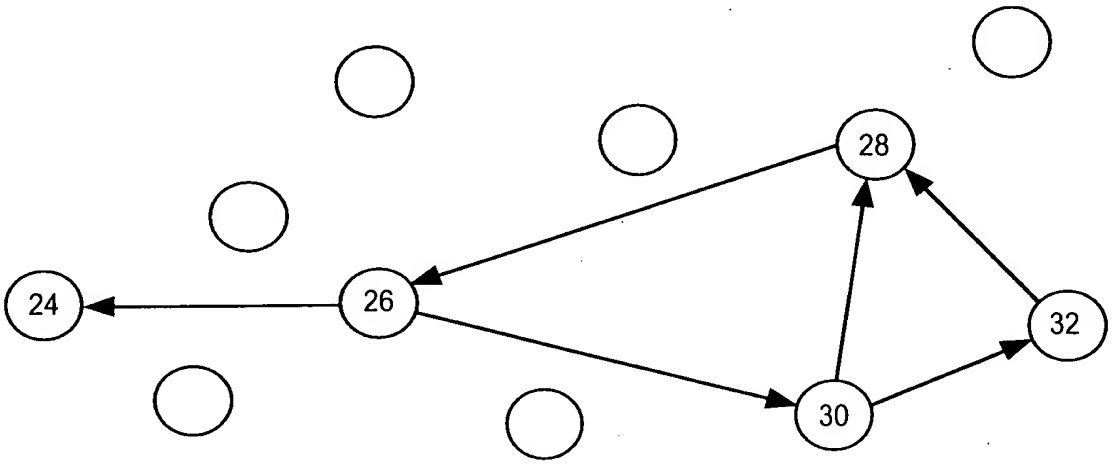


FIG. 2



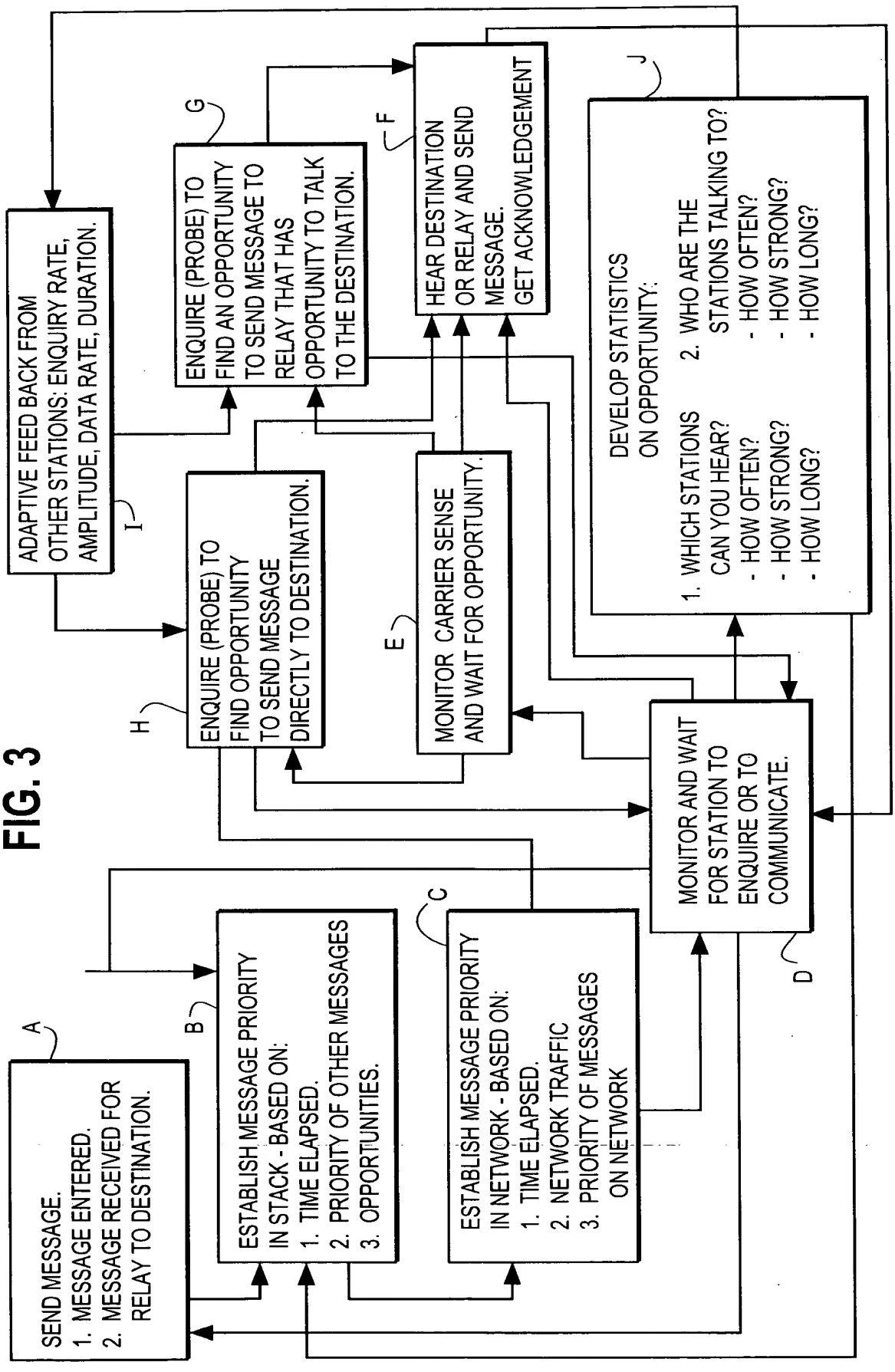

SEND MESSAGE.
1. MESSAGE ENTERED.
2. MESSAGE RECEIVED FOR RELAY TO DESTINATION.
A
ESTABLISH MESSAGE PRIORITY IN STACK - BASED ON:
1. TIME ELAPSED.
2. PRIORITY OF OTHER MESSAGES
3. OPPORTUNITIES.
B
ESTABLISH MESSAGE PRIORITY IN NETWORK - BASED ON:
1. TIME ELAPSED.
2. NETWORK TRAFFIC
3. PRIORITY OF MESSAGES ON NETWORK
C
MONITOR AND WAIT FOR STATION TO ENQUIRE OR TO COMMUNICATE.
D
MONITOR CARRIER SENSE AND WAIT FOR OPPORTUNITY.
E
HEAR DESTINATION OR RELAY AND SEND MESSAGE. GET ACKNOWLEDGEMENT
F
ENQUIRE (PROBE) TO FIND AN OPPORTUNITY TO SEND MESSAGE TO RELAY THAT HAS OPPORTUNITY TO TALK TO THE DESTINATION.
G
ENQUIRE (PROBE) TO FIND OPPORTUNITY TO SEND MESSAGE DIRECTLY TO DESTINATION.
H
ADAPTIVE FEED BACK FROM OTHER STATIONS: ENQUIRY RATE, AMPLITUDE, DATA RATE, DURATION.
I
DEVELOP STATISTICS ON OPPORTUNITY:
1. WHICH STATIONS CAN YOU HEAR?
- HOW OFTEN?
- HOW STRONG?
- HOW LONG?
2. WHO ARE THE STATIONS TALKING TO?
- HOW OFTEN?
- HOW STRONG?
- HOW LONG?
J

FIG. 3

FIG. 4A

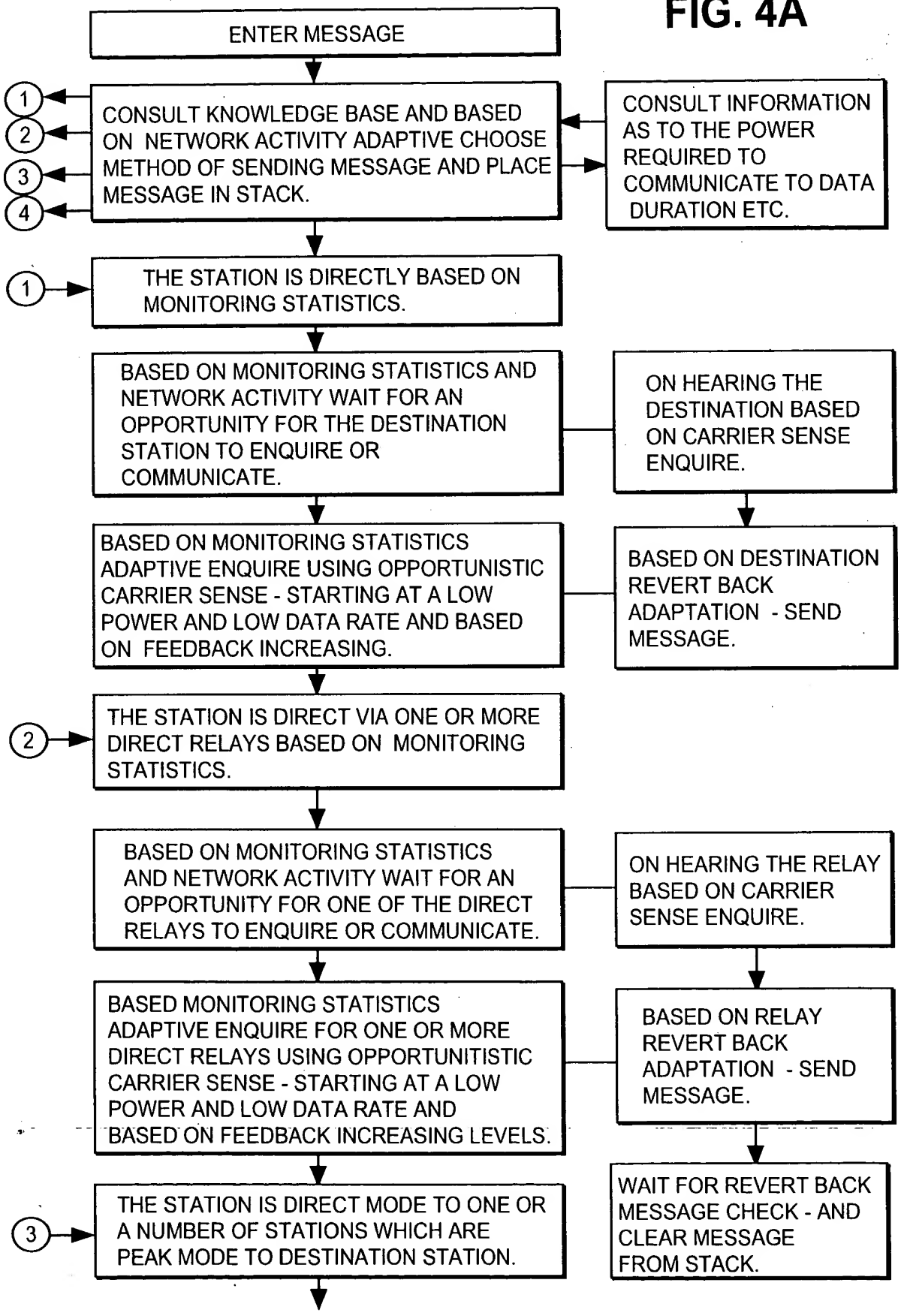

ENTER MESSAGE
1
2
3
4
CONSULT KNOWLEDGE BASE AND BASED ON NETWORK ACTIVITY ADAPTIVE CHOOSE METHOD OF SENDING MESSAGE AND PLACE MESSAGE IN STACK.
CONSULT INFORMATION AS TO THE POWER REQUIRED TO COMMUNICATE TO DATA DURATION ETC.
1
THE STATION IS DIRECTLY BASED ON MONITORING STATISTICS.
BASED ON MONITORING STATISTICS AND NETWORK ACTIVITY WAIT FOR AN OPPORTUNITY FOR THE DESTINATION STATION TO ENQUIRE OR COMMUNICATE.
ON HEARING THE DESTINATION BASED ON CARRIER SENSE ENQUIRE.
BASED ON MONITORING STATISTICS ADAPTIVE ENQUIRE USING OPPORTUNISTIC CARRIER SENSE - STARTING AT A LOW POWER AND LOW DATA RATE AND BASED ON FEEDBACK INCREASING.
BASED ON DESTINATION REVERT BACK ADAPTATION - SEND MESSAGE.
2
THE STATION IS DIRECT VIA ONE OR MORE DIRECT RELAYS BASED ON MONITORING STATISTICS.
BASED ON MONITORING STATISTICS AND NETWORK ACTIVITY WAIT FOR AN OPPORTUNITY FOR ONE OF THE DIRECT RELAYS TO ENQUIRE OR COMMUNICATE.
ON HEARING THE RELAY BASED ON CARRIER SENSE ENQUIRE.
BASED MONITORING STATISTICS ADAPTIVE ENQUIRE FOR ONE OR MORE DIRECT RELAYS USING OPPORTUNITISTIC CARRIER SENSE - STARTING AT A LOW POWER AND LOW DATA RATE AND BASED ON FEEDBACK INCREASING LEVELS.
BASED ON RELAY REVERT BACK ADAPTATION - SEND MESSAGE.
3
THE STATION IS DIRECT MODE TO ONE OR A NUMBER OF STATIONS WHICH ARE PEAK MODE TO DESTINATION STATION.
WAIT FOR REVERT BACK MESSAGE CHECK - AND CLEAR MESSAGE FROM STACK.

FIG. 4B

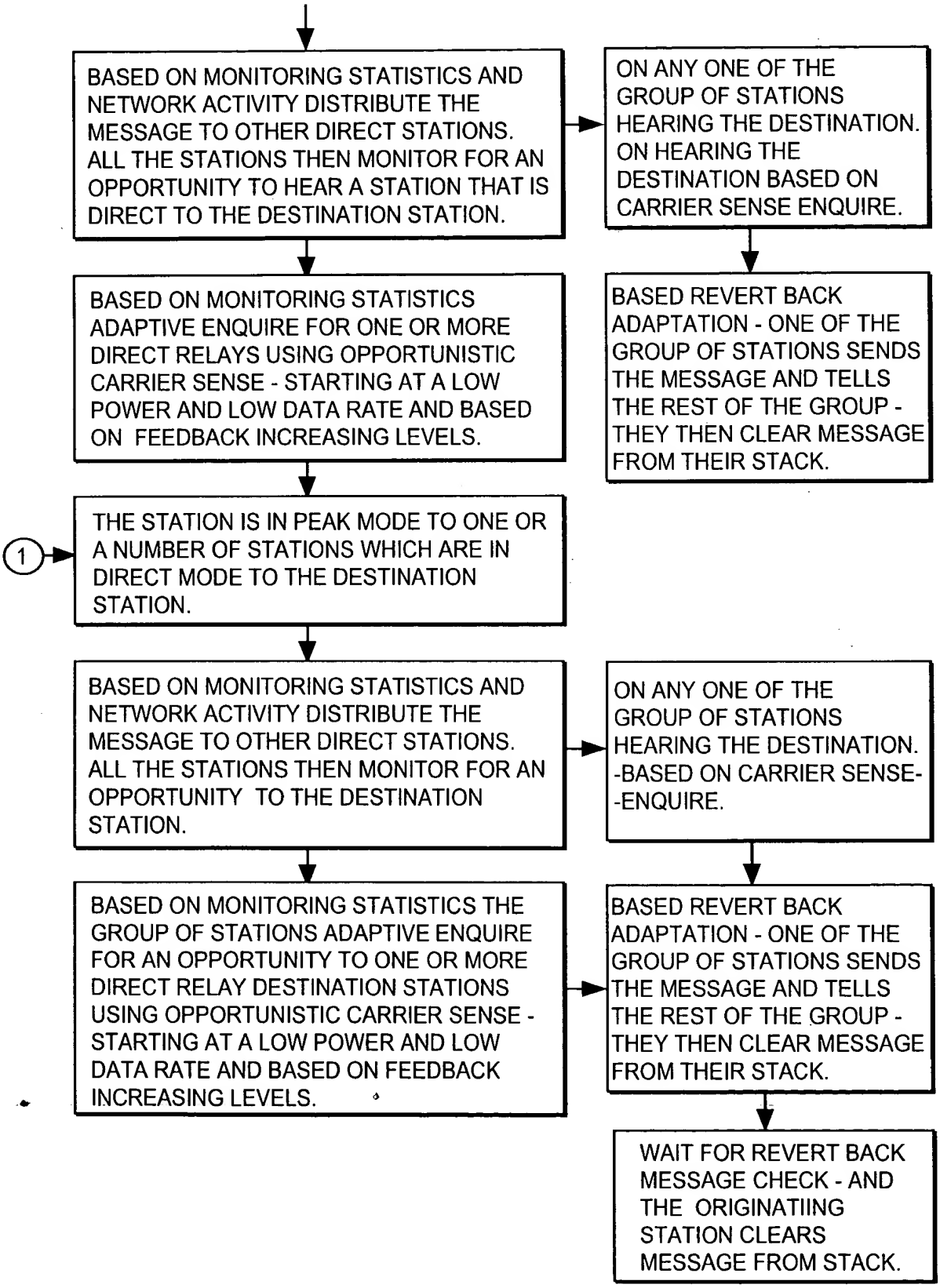

BASED ON MONITORING STATISTICS AND NETWORK ACTIVITY DISTRIBUTE THE MESSAGE TO OTHER DIRECT STATIONS. ALL THE STATIONS THEN MONITOR FOR AN OPPORTUNITY TO HEAR A STATION THAT IS DIRECT TO THE DESTINATION STATION.
ON ANY ONE OF THE GROUP OF STATIONS HEARING THE DESTINATION. ON HEARING THE DESTINATION BASED ON CARRIER SENSE ENQUIRE.
BASED ON MONITORING STATISTICS ADAPTIVE ENQUIRE FOR ONE OR MORE DIRECT RELAYS USING OPPORTUNISTIC CARRIER SENSE - STARTING AT A LOW POWER AND LOW DATA RATE AND BASED ON FEEDBACK INCREASING LEVELS.
BASED REVERT BACK ADAPTATION - ONE OF THE GROUP OF STATIONS SENDS THE MESSAGE AND TELLS THE REST OF THE GROUP - THEY THEN CLEAR MESSAGE FROM THEIR STACK.
1
THE STATION IS IN PEAK MODE TO ONE OR A NUMBER OF STATIONS WHICH ARE IN DIRECT MODE TO THE DESTINATION STATION.
BASED ON MONITORING STATISTICS AND NETWORK ACTIVITY DISTRIBUTE THE MESSAGE TO OTHER DIRECT STATIONS. ALL THE STATIONS THEN MONITOR FOR AN OPPORTUNITY TO THE DESTINATION STATION.
ON ANY ONE OF THE GROUP OF STATIONS HEARING THE DESTINATION. -BASED ON CARRIER SENSE- -ENQUIRE.
BASED ON MONITORING STATISTICS THE GROUP OF STATIONS ADAPTIVE ENQUIRE FOR AN OPPORTUNITY TO ONE OR MORE DIRECT RELAY DESTINATION STATIONS USING OPPORTUNISTIC CARRIER SENSE - STARTING AT A LOW POWER AND LOW DATA RATE AND BASED ON FEEDBACK INCREASING LEVELS.
BASED REVERT BACK ADAPTATION - ONE OF THE GROUP OF STATIONS SENDS THE MESSAGE AND TELLS THE REST OF THE GROUP - THEY THEN CLEAR MESSAGE FROM THEIR STACK.
WAIT FOR REVERT BACK MESSAGE CHECK - AND THE ORIGINATIING STATION CLEARS MESSAGE FROM STACK.

FIG. 5

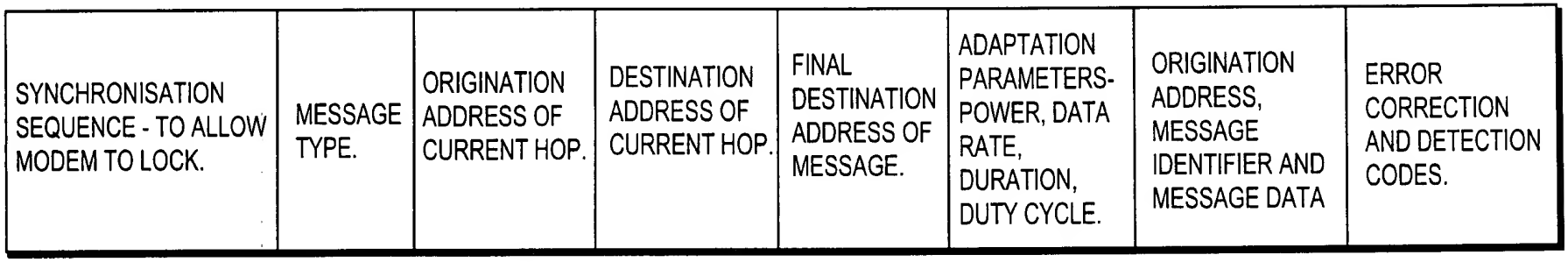
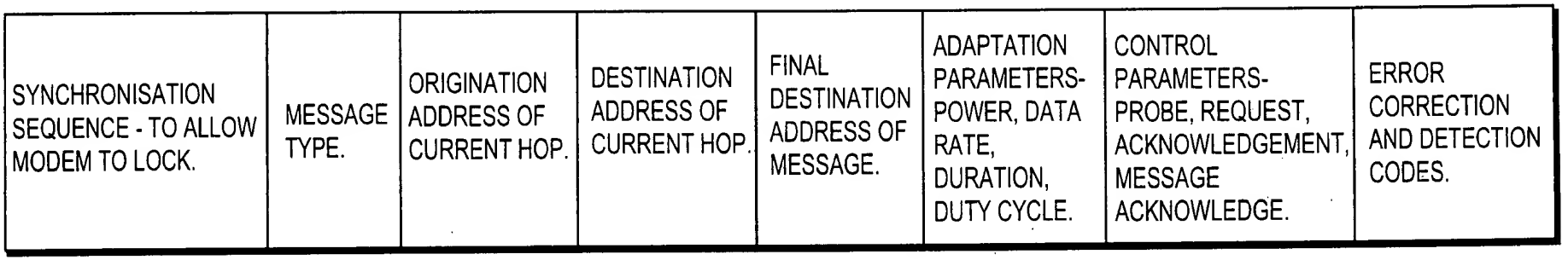

SYNCHRONISATION SEQUENCE - TO ALLOW MODEM TO LOCK.
MESSAGE TYPE.
ORIGINATION ADDRESS OF CURRENT HOP.
DESTINATION ADDRESS OF CURRENT HOP.
FINAL DESTINATION ADDRESS OF MESSAGE.
ADAPTATION PARAMETERS- POWER, DATA RATE, DURATION, DUTY CYCLE.
ORIGINATION ADDRESS, MESSAGE IDENTIFIER AND MESSAGE DATA
ERROR CORRECTION AND DETECTION CODES.

FIG. 6


SYNCHRONISATION SEQUENCE - TO ALLOW MODEM TO LOCK.
MESSAGE TYPE.
ORIGINATION ADDRESS OF CURRENT HOP.
DESTINATION ADDRESS OF CURRENT HOP.
FINAL DESTINATION ADDRESS OF MESSAGE.
ADAPTATION PARAMETERS- POWER, DATA RATE, DURATION, DUTY CYCLE.
CONTROL PARAMETERS- PROBE, REQUEST, ACKNOWLEDGEMENT, MESSAGE ACKNOWLEDGE.
ERROR CORRECTION AND DETECTION CODES.

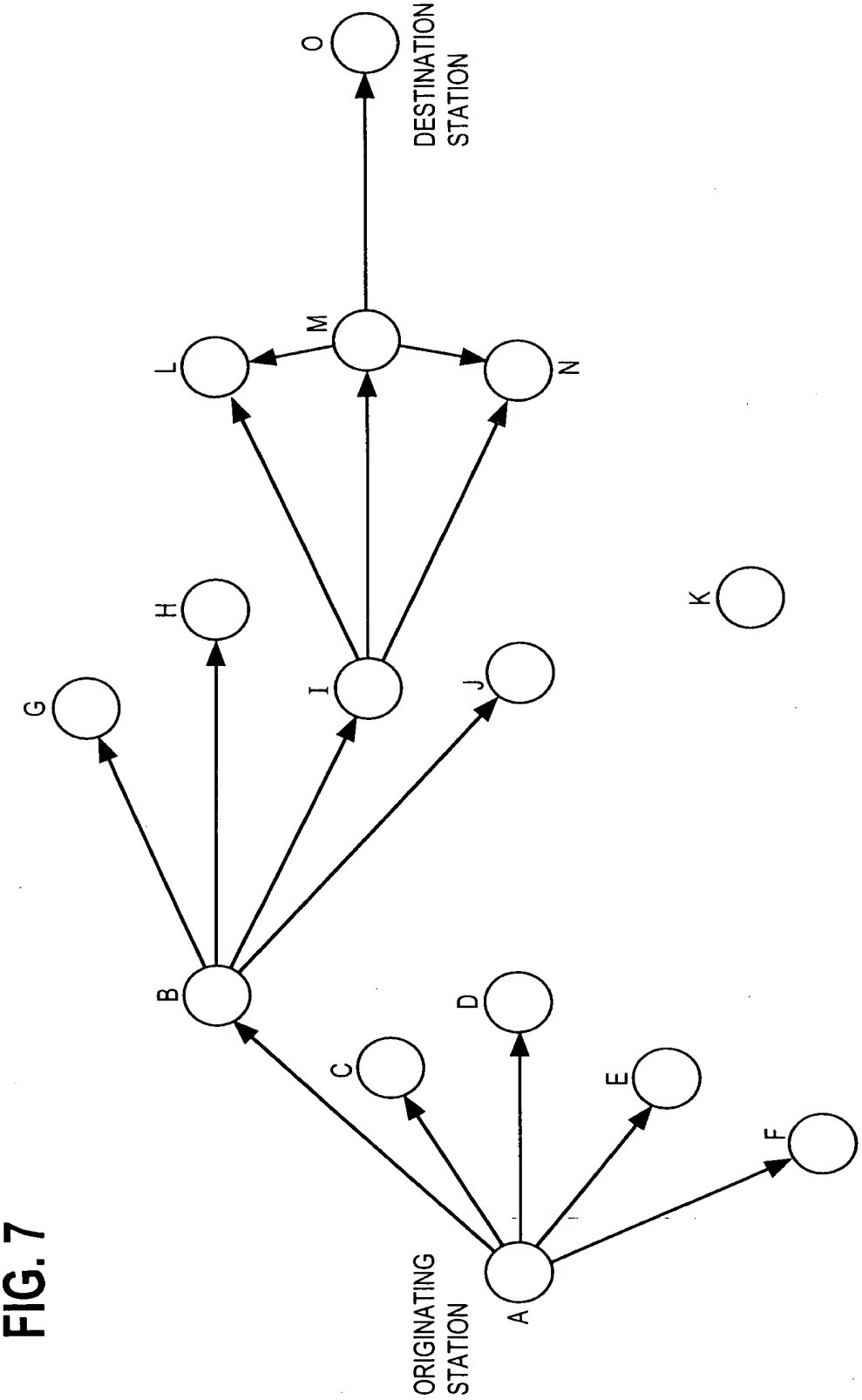

ORIGINATING STATION
A
B
C
D
E
F
G
H
I
J
K
L
M
N
O
DESTINATION STATION

FIG. 7

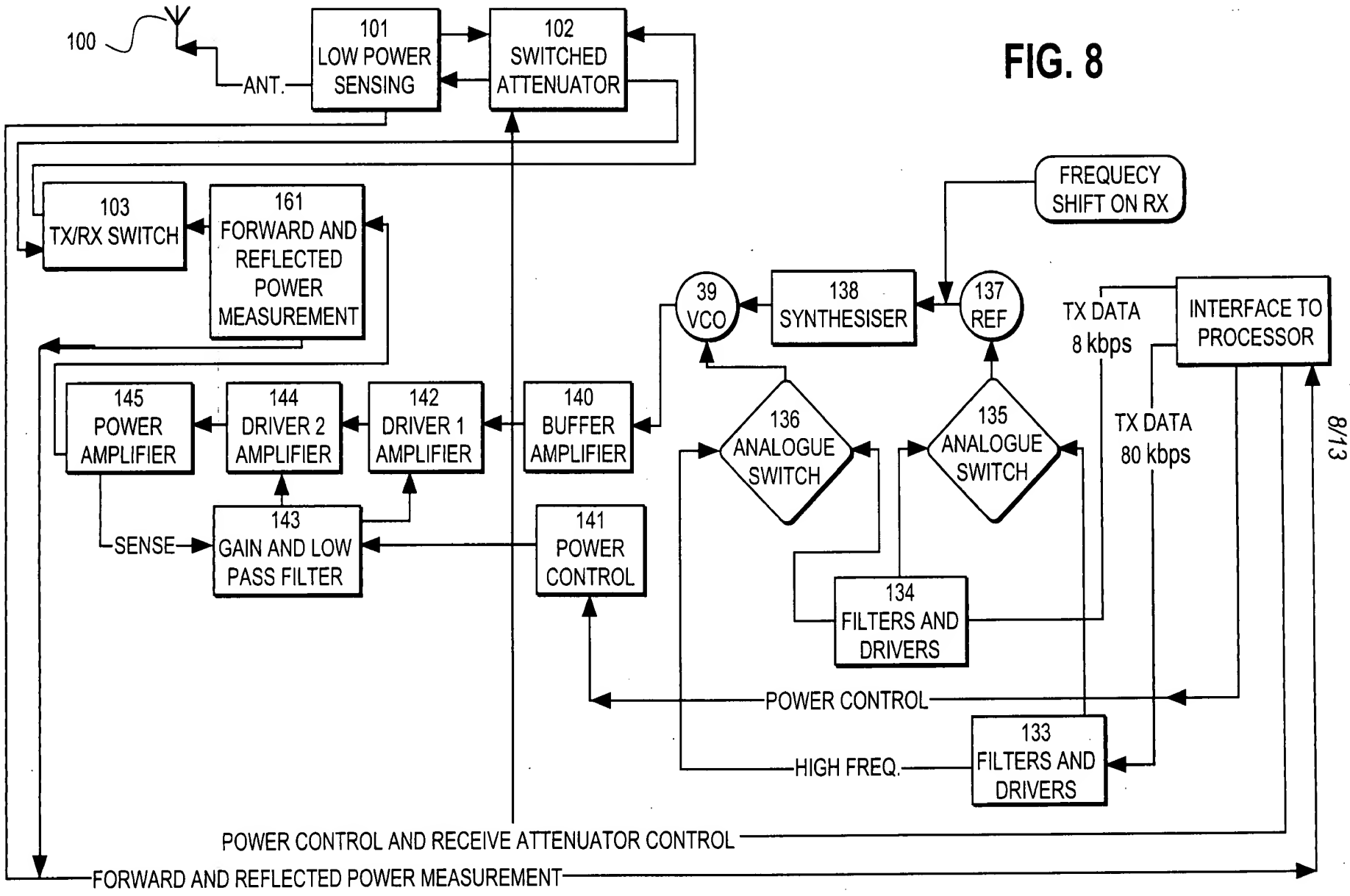

100
ANT.
101
LOW POWER
SENSING
102
SWITCHED
ATTENUATOR
103
TX/RX SWITCH
161
FORWARD AND
REFLECTED
POWER
MEASUREMENT
FREQUECY
SHIFT ON RX
39
VCO
138
SYNTHESISER
137
REF
TX DATA
8 kbps
INTERFACE TO
PROCESSOR
145
POWER
AMPLIFIER
144
DRIVER 2
AMPLIFIER
142
DRIVER 1
AMPLIFIER
140
BUFFER
AMPLIFIER
136
ANALOGUE
SWITCH
135
ANALOGUE
SWITCH
TX DATA
80 kbps
SENSE
143
GAIN AND LOW
PASS FILTER
141
POWER
CONTROL
134
FILTERS AND
DRIVERS
POWER CONTROL
133
FILTERS AND
DRIVERS
HIGH FREQ.
POWER CONTROL AND RECEIVE ATTENUATOR CONTROL
FORWARD AND REFLECTED POWER MEASUREMENT

FIG. 8

8/13

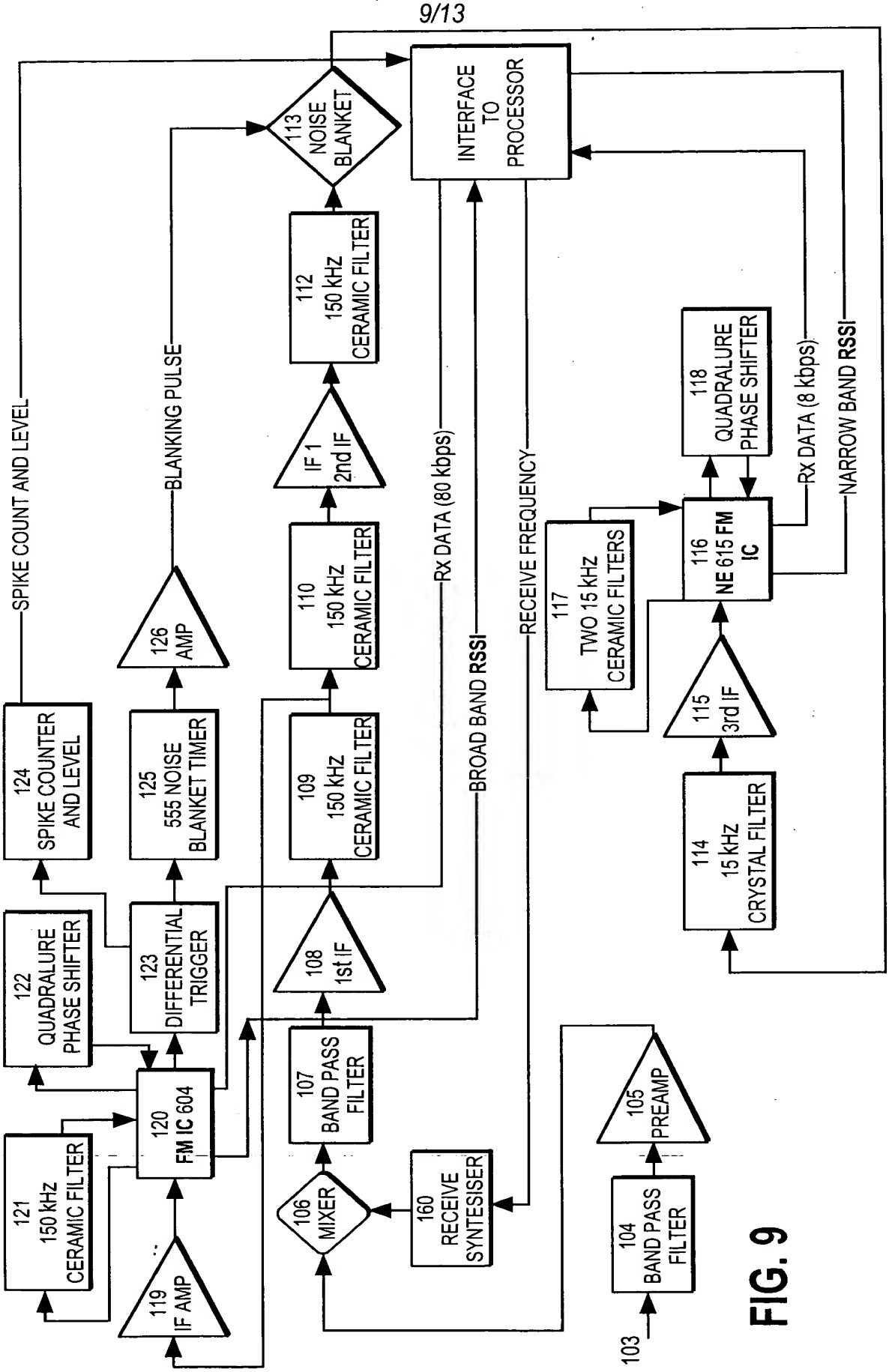

103
104 BAND PASS FILTER
105 PREAMP
106 MIXER
107 BAND PASS FILTER
108 1st IF
109 150 kHz CERAMIC FILTER
110 150 kHz CERAMIC FILTER
112 150 kHz CERAMIC FILTER
IF 1 2nd IF
113 NOISE BLANKET
INTERFACE TO PROCESSOR
114 15 kHz CRYSTAL FILTER
115 3rd IF
116 NE 615 FM IC
117 TWO 15 kHz CERAMIC FILTERS
118 QUADRALURE PHASE SHIFTER
119 IF AMP
120 FM IC 604
121 150 kHz CERAMIC FILTER
122 QUADRALURE PHASE SHIFTER
123 DIFFERENTIAL TRIGGER
124 SPIKE COUNTER AND LEVEL
125 555 NOISE BLANKET TIMER
126 AMP
160 RECEIVE SYNTESISER
SPIKE COUNT AND LEVEL
BLANKING PULSE
Rx DATA (80 kbps)
BROAD BAND RSSI
RECEIVE FREQUENCY
Rx DATA (8 kbps)
NARROW BAND RSSI

FIG. 9

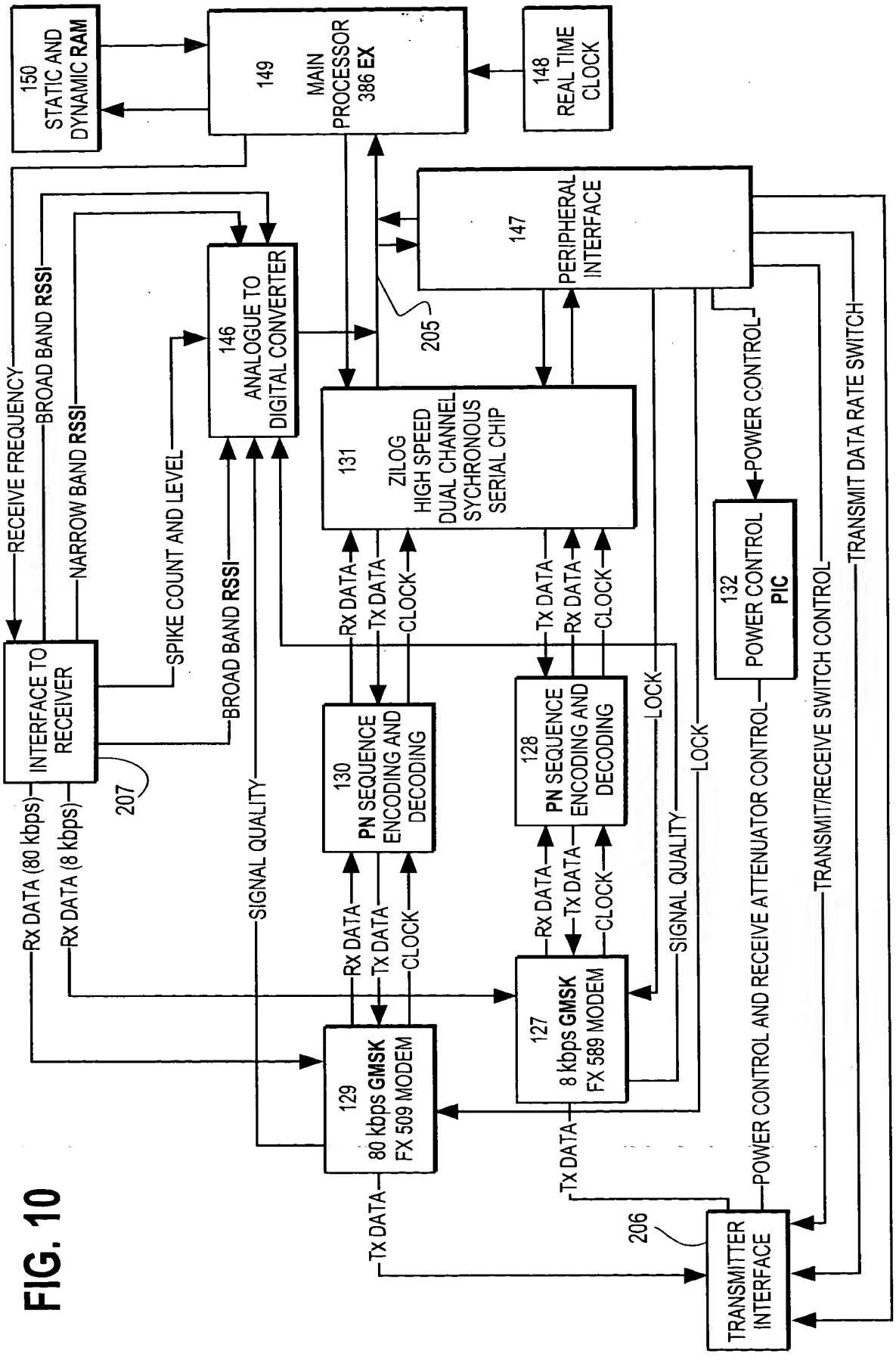

150 STATIC AND DYNAMIC RAM
149 MAIN PROCESSOR 386 EX
148 REAL TIME CLOCK
147 PERIPHERAL INTERFACE
146 ANALOGUE TO DIGITAL CONVERTER
131 ZILOG HIGH SPEED DUAL CHANNEL SYCHRONOUS SERIAL CHIP
132 POWER CONTROL PIC
130 PN SEQUENCE ENCODING AND DECODING
128 PN SEQUENCE ENCODING AND DECODING
129 80 kbps GMSK FX 509 MODEM
127 8 kbps GMSK FX 589 MODEM
INTERFACE TO RECEIVER
TRANSMITTER INTERFACE
205
206
207
RECEIVE FREQUENCY
BROAD BAND RSSI
NARROW BAND RSSI
SPIKE COUNT AND LEVEL
BROAD BAND RSSI
SIGNAL QUALITY
Rx DATA (80 kbps)
Rx DATA (8 kbps)
RX DATA
TX DATA
CLOCK
LOCK
POWER CONTROL
TRANSMIT DATA RATE SWITCH
TRANSMIT/RECEIVE SWITCH CONTROL
POWER CONTROL AND RECEIVE ATTENUATOR CONTROL

FIG. 10

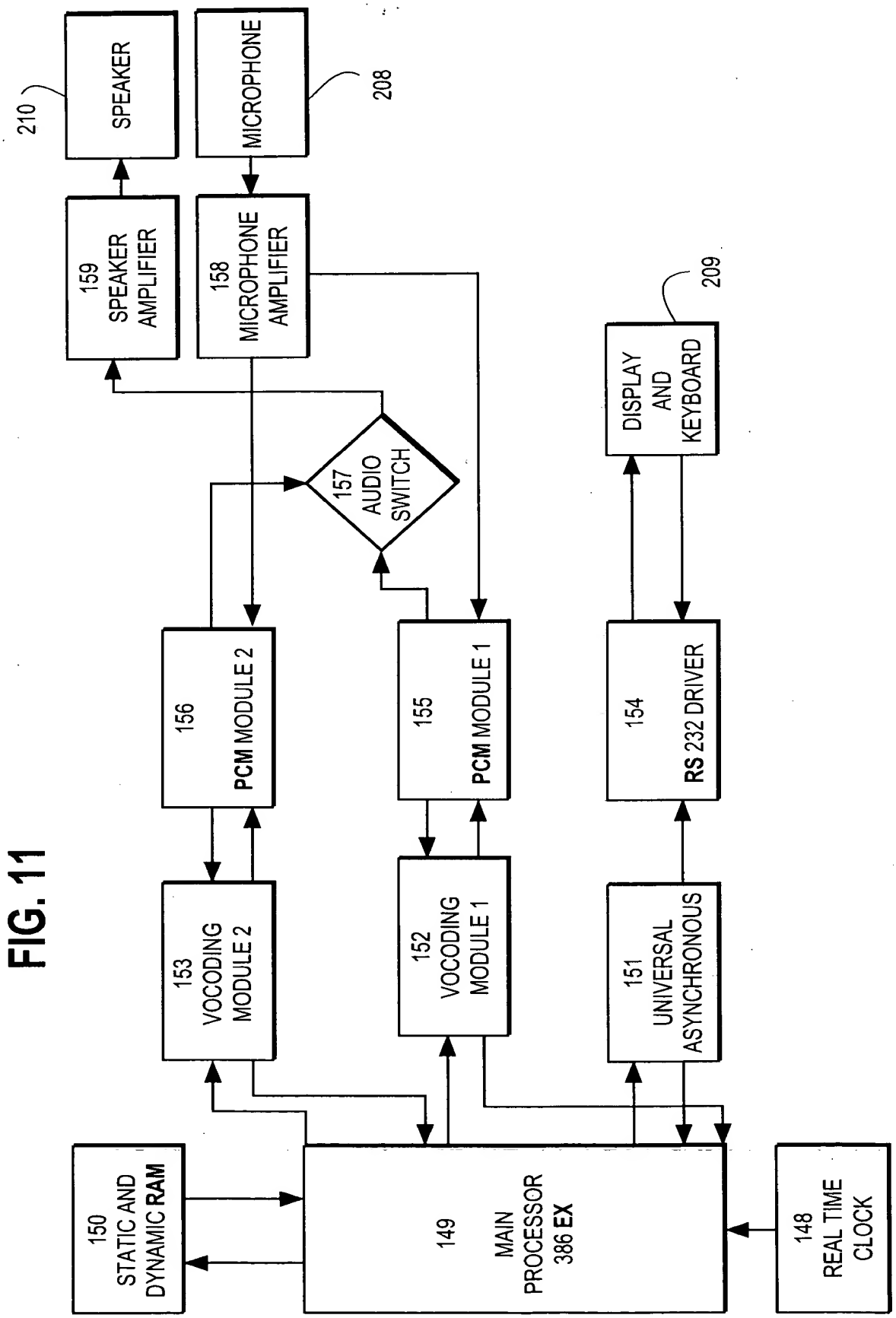

210
SPEAKER
MICROPHONE
208
159
SPEAKER
AMPLIFIER
158
MICROPHONE
AMPLIFIER
209
DISPLAY
AND
KEYBOARD
157
AUDIO
SWITCH
156
PCM MODULE 2
155
PCM MODULE 1
154
RS 232 DRIVER
153
VOCODING
MODULE 2
152
VOCODING
MODULE 1
151
UNIVERSAL
ASYNCHRONOUS
150
STATIC AND
DYNAMIC RAM
149
MAIN
PROCESSOR
386 EX
148
REAL TIME
CLOCK

FIG. 11

FIG. 12

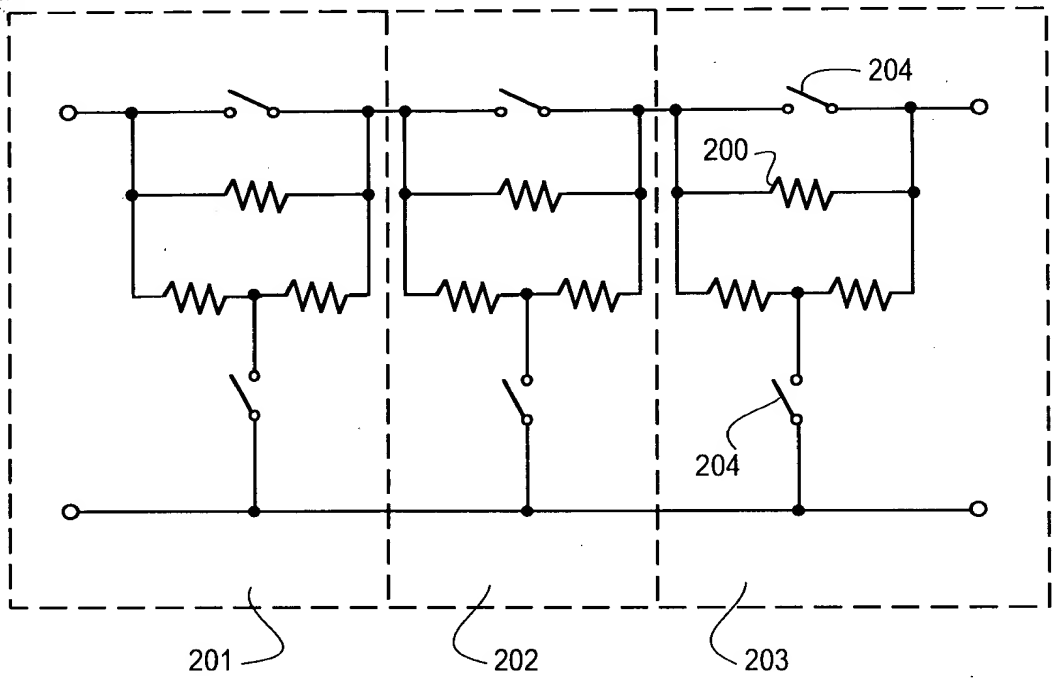
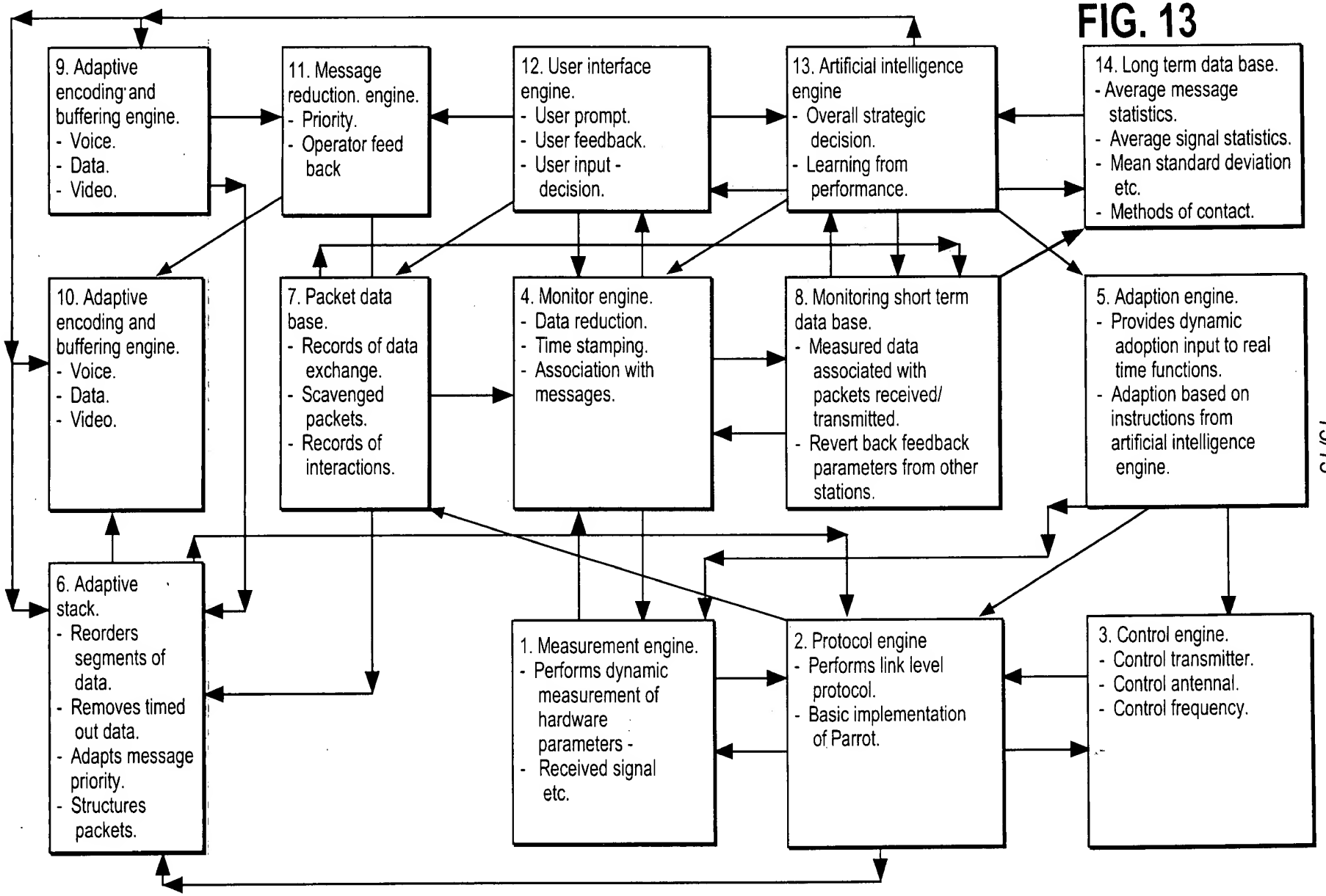


FIG. 13


9. Adaptive encoding and buffering engine.
- Voice.
- Data.
- Video.
11. Message reduction. engine.
- Priority.
- Operator feed back
12. User interface engine.
- User prompt.
- User feedback.
- User input - decision.
13. Artificial intelligence engine
- Overall strategic decision.
- Learning from performance.
14. Long term data base.
- Average message statistics.
- Average signal statistics.
- Mean standard deviation etc.
- Methods of contact.
10. Adaptive encoding and buffering engine.
- Voice.
- Data.
- Video.
7. Packet data base.
- Records of data exchange.
- Scavenged packets.
- Records of interactions.
4. Monitor engine.
- Data reduction.
- Time stamping.
- Association with messages.
8. Monitoring short term data base.
- Measured data associated with packets received/ transmitted.
- Revert back feedback parameters from other stations.
5. Adaption engine.
- Provides dynamic adoption input to real time functions.
- Adaption based on instructions from artificial intelligence engine.
6. Adaptive stack.
- Reorders segments of data.
- Removes timed out data.
- Adapts message priority.
- Structures packets.
1. Measurement engine.
- Performs dynamic measurement of hardware parameters -
- Received signal etc.
2. Protocol engine
- Performs link level protocol.
- Basic implementation of Parrot.
3. Control engine.
- Control transmitter.
- Control antennal.
- Control frequency.